

Total No. of Questions : 8]

SEAT No. :

P3835

[Total No. of Pages : 2

[5870]-1093

T.E. (Electronics Engineering)

E - MOBILITY

(2019 Pattern) (Elective - II) (Semester - II) (304215E)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) Neat diagrams and waveforms must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) Use of nonprogrammable calculator is allowed.*
- 5) Assume suitable data if necessary.*

Q1) a) Explain in brief Metal Air Battery, Zinc Chloride battery. **[6]**

b) Compare flywheel energy storage system & hydraulic energy storage system. **[5]**

c) Explain construction & working of Sodium based batteries. **[6]**

OR

Q2) a) Explain role of Ultra capacitors in energy storage system of EVs. **[6]**

b) Explain construction & working of Lithium based batteries. **[7]**

c) Compare Lead Acid battery & Nickel based battery. **[4]**

Q3) a) Explain with block diagram OFF board conductive charging. **[8]**

b) Explain various requirements for a battery charger in EVs. **[5]**

c) Explain concept of charge equalization process in battery. **[5]**

OR

Q4) a) Explain various battery indication methods. **[8]**

b) Standard power levels of conductive chargers - Explain. **[5]**

c) Explain with diagram working of basic charger circuit. **[5]**

P.T.O.

- Q5)** a) Explain various types of EV charging connectors. [6]
b) Explain North American EV Plug Standards. [6]
c) Explain Occasional Charging Station. [5]

OR

- Q6)** a) Explain Fast Charging station. [5]
b) Explain public charging infrastructure. [6]
c) Explain European EV Plug Standards. [6]

- Q7)** a) Explain with diagram 6LoWPAN protocol? Give its applications. [8]
b) Explain with diagram power line carrier communication. [6]
c) Explain I2C protocol. [4]

OR

- Q8)** a) What is Ethernet? Why it is used? Give its advantages & disadvantages. [8]
b) Explain with diagram LIN bus protocol. [6]
c) What is Modbus protocol? Explain where it is used. [4]

